

REMARKS

Claims 8, 10-12, 20-25, and 27-30 remain pending in the present application as amended and have been rejected. Claims 8, 20, and 25 have been amended. No claims have been added or canceled. Applicants respectfully submit that no new matter has been added to the application by the amendment. Notably, ‘typing a column with a container so as to associate the column with the container and thereby require . . . ’ is disclosed in the application as filed at least at paragraph 0075 (as published).

TELEPHONE CONVERSATION WITH EXAMINER

Examiner Chen is thanked for the telephone conversation conducted on March 4, 2009. Proposed claim amendments were discussed. Cited art was discussed. Examiner Chen stated that “typing” was not defined in the claims, and suggested amending the claims to more clearly describe typing.

SECTION 101 REJECTION

The Examiner has rejected claims 20-23 under 35 U.S.C. § 101 as being non-statutory. Applicants respectfully traverse the Section 101 rejection insofar as it may be applied to the claims as amended.

According to the Examiner, the claims recite a method without regard to any machine employed to carry out the method. Without prejudice or disclaimer, Applicants have amended independent claim 20 to recite “processor-implemented method” and that the step of creating is performed via the processor. Thus, Applicants respectfully submit that claim 20 and all claims depending therefrom are statutory. As a result, Applicants respectfully request reconsideration and withdrawal of the Section 101 rejection.

SECTION 112, SECOND PARAGRAPH REJECTION

The Examiner has rejected the claims under 35 U.S.C. § 112, second paragraph as being indefinite. Applicants respectfully traverse the Section 112, second paragraph rejection insofar as it may be applied to the claims as amended.

According to the Examiner, multiple uses of the terms 'comprising' and 'and' render the claims unclear. Accordingly, Applicants have amended independent claims 8, 20, and 25 to remove most instances of the aforementioned terms. Thus, Applicants respectfully submit that such claims and all claims depending therefrom are clear. As a result, Applicants respectfully request reconsideration and withdrawal of the Section 112, second paragraph rejection.

SECTION 102 REJECTION

The Examiner has now rejected the claims under 35 U.S.C. § 102 as being anticipated by Murthy et al. (U.S. Patent No. 7,096,224). Applicants respectfully traverse the Section 102 rejection insofar as it may be applied to the claims as amended. In particular, Applicants respectfully submit that the Murthy reference fails to disclose or even suggest enabling the use of XML instances of different schemas in the same column of a [relational] database by typing the database column with an XML schema collection object (i.e., container) so as to require that an XML instance stored in the column and/or any other XML instance stored in the column conforms to the schema of any of at least two XML schema namespace URIs in the container, particularly in the manner recited in independent claims 8, 20, and 25 as amended.

As was previously pointed out, the present application is directed toward storing XML instances conforming to not just one but several schemas in the same column of a relational database. In particular, and as noted in the present application at about paragraphs 0052-0054 (as published), existing database management systems provide support for storing XML data in a relational database store, where one can create a table with one or more XML columns, store XML values in the XML columns, type an XML column using an XML schema namespace, index the XML column, and query against the XML instances.

Previously, only XML data conforming to a single schema could be stored in a single column of a relational database. The column would be 'typed' according to the schema / schema namespace, and any XML instance data that did not conform to the typed schema of the column would generate an error. As a result, in the past, developers would resort to defining a schema or redefining an existing schema so as to in effect shoe-horn XML instance data of two schema types in one column. To recreate the schema each time the needs of storage change, however, is a cumbersome process.

The present application, then, introduces the concept of typing the single column of the relational database according to an XML schema collection object that contains therein references to multiple schemas. That is, rather than typing the column according to a single schema, the column is typed according to an object or container that refers to multiple schemas. Thus, with such an XML schema collection object or container typing the single column of the relational database, storage of XML instances conforming to any of multiple schemas in the single column of the relational database is facilitated, with the requirement being that each XML instance must conform to at least one of any of the schemas referenced by the container.

Applicants respectfully point out that, as set forth in the application as filed at paragraph 0075 (as published), "typing" an XML column refers to associating that column with an XML Schema Collection object. FIG. 9 illustrates one non-limiting example of how to "type" or "re-type" an XML column in a relational database. "SqlID" 901 is a SQL SERVER.RTM. (XML Schema Collection Identifier. "table_name" 910 is a relational table. "column_name" 920 is a column in "table_name" 910. In this scenario, if "SqlID" 901 is not specified then the XML column 920 is made un-typed. The syntax of FIG. 9 alters the column 920 meta-data. A typed XML column 920 may be made untyped (in which case it requires no validation), or an untyped XML column 920 may be typed using a SQL XML Schema Collection Identifier (which requires validation).

When creating an XML schema collection object or the like in accordance with the present application, a container object is created and multiple schemas are specified. Next, a function call is made which assigns the XML schema collection object to the single column to

type same with such object. XML instances in the single column can then be validated according to any of the multiple schemas represented by the XML schema collection object, rather than just a single schema as was previously the case.

In a Response to Arguments at about page 9 of the Office Action, the Examiner notes that the feature of 'typing a column according to an XML schema collection object that contains references to multiple schemas' was argued but not recited in the claims prior to the present Amendment. Applicants respectfully submit that the essence of such a feature was already present in such claims, but nevertheless have amended the claims to make such a feature more explicit. *In particular, Applicants have amended the typing clause in each independent claim to recite 'typing said database column with said container so as to associate the column with the container and thereby require that the XML instance stored in the column and any other XML instance stored in the column conforms to the schema of any of the at least two of the XML schema namespace URIs in the container'.* Applicants respectfully submit that the Murthy reference does not disclose or even suggest such feature.

Independent claim 20 as amended recites a method of validating Extensible Markup Language (XML) instances to be stored in a column of a relational database. In the method, a container for a plurality of XML schema namespaces is created, where each XML schema namespace uniquely identifies a collection of element type and attribute names, each XML schema namespace identifies a location of a schema document corresponding to and defining the uniquely identified collection, and where each XML schema namespace thereby specifies a schema for any of a plurality of XML instances conforming to the schema document. Each XML instance is a set of XML data conforming to the schema specified by an XML schema namespace.

At least two XML schema namespaces are placed in the container (**thereby associating at least two corresponding schemas with the container**), and a column of a relational database is typed with the container so as to associate the column with the container and thereby require that any XML instance stored in the column conforms to the schema of one of the XML schema namespaces in the container (**thereby allowing the column to in effect be typed with the**

multiple schemas specified by the container). As was set forth immediately above, the typing is now recited to comprise *ensuring that any XML instances existing in the column prior to the typing conforms to the schema of any of the at least two of the XML schema namespace URIs in the container*. Prior to storing an XML instance in the column, it is ensured that the XML instance conforms to the schema of one of the XML schema namespaces in the container, and the XML instance is in fact stored in the column upon so ensuring.

Independent claim 8 recites the subject matter of claim 20, albeit in the form of a database system and with some slight modification. Similarly, independent claim 25 recites the subject matter of claim 20, albeit in the form of a computer-readable medium and with some slight modification.

As was previously pointed out, the Murthy reference discloses registering XML schemas in a database system. However, such registering employs mappings of XML types to SQL types, and does not at all recognize that multiple XML instances should or could be stored in a single column of a relational database, as is the case with the claims of the present application. Notably, the Murthy reference does not disclose or even suggest the use of a container that holds a plurality of XML schema namespaces, where each XML schema namespace effectively specifies a schema, or that at least two XML schema namespaces are placed in the container such that the container effectively specifies multiple schemas, as is the case with claims 8, 20, and 25 of the present application.

Also, the Murthy reference does not disclose or even suggest that a column of a relational database is typed with the container so as to require that XML instances in the column conform to the schema of any of the at least two of the XML schema namespace URIs in the container, as is now recited in claims 8, 20, and 25, and correspondingly so as to allow any XML instance stored in the column to conform to any of the multiple schemas referenced by the container. As a result, the Murthy reference does not disclose or even suggest that such typing of a column of a relational database ensures that any XML instances in the column conform to at least one of the schemas referenced by the container.

The Examiner has argued that the XML code at the top of column 5 of the Murthy reference disclose a container with the at least two URIs as is recited in the claims. However, Applicants respectfully submit that such XML code is specified as representing only a single schema (xmlns), and therefore is not a container that specifies multiple schemas as is recited in the claims. Moreover, the XML code is not employed in the Murthy reference to type a column of a relational database, as is required by the claims of the present application, particularly so as to associate the column with the container and thereby require that any XML instance stored in the column conforms to the schema of one of the XML schema namespaces in the container, as is also required by the claims.

Thus, for all of the aforementioned reasons, Applicants respectfully submit that the Murthy reference does not make anticipate claims 8, 20, or 25 or any claims depending therefrom, including claims 10-12, 21-24, and 27-30. Accordingly, Applicants respectfully request reconsideration and withdrawal of the Section 102 rejection.

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PATENT

In view of the foregoing Amendment and Remarks, Applicants respectfully submit that the present Application including claims 8, 10-12, 20-25, and 27-30 is in condition for Allowance and such action is respectfully requested.

Respectfully submitted,

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